

Structures, Processes, and Responses of Plants

6-2 The student will demonstrate an understanding of structures, processes, and responses of plants that allow them to survive and reproduce. (Life Science)

6.2.6 Differentiate between the processes of sexual and asexual reproduction of flowering plants.

Taxonomy level: 4.1-B Analyze Conceptual Knowledge

Previous/Future knowledge: This is the first time that students have been introduced to the terms sexual and asexual reproduction. They have studied the process of reproduction in flowering plants in 1st and 3rd grades.

It is essential for students to know the difference between sexual and asexual reproduction in flowering plants.

Sexual reproduction

- A process of reproduction that requires a sperm cell (in pollen) and an egg cell (in the ovule) to combine to produce a new organism.
- All flowering plants undergo sexual reproduction.

Asexual reproduction

- A process of reproduction that involves only one parent plant or plant part and produces offspring identical to the parent plant.
- Many plants can grow new plants asexually from their plant parts.
- If a plant is cut or damaged, it can sprout new growth from the stems, roots, or leaves.

Plants use a variety of parts to produce new plants such as:

Tubers, bulbs

- These are all types of underground stems.
- The “eyes” or buds of tubers, for example potatoes, grow into roots and shoots to produce a new plant.
- Bulbs, for example onions, are big buds made of a stem and special types of leaves.

Runners

- These are all types of stems that run along the ground.
- New strawberries or some ivy grow from the tips of runners.
- Many lawn grasses grow from runners.

Stem Cuttings

- When a piece of cut stem is planted, roots may form from the cutting, and then a full plant develops.
- Sugar cane and pineapple are examples of plants grown from stem cuttings.

Roots

- Some fruit trees and bushes send up “suckers” or new shoots from the roots.
- Some plants have roots that can produce new plants from root pieces, such as a sweet potato.

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Leaves

- Some houseplants produce little plants right on their leaves.
- For example, African violets can produce plants from leaves placed on top of soil.

It is not essential for students to know how reproduction occurs in nonvascular plants, cone-bearing plants, or spore-producing plants.

Assessment Guidelines:

The objective of this indicator is to *differentiate* between sexual and asexual reproduction in plants; therefore, the primary focus of assessment should be to distinguish between processes and structures that result in asexual reproduction from those that result in sexual reproduction in plants. However, appropriate assessments should also require student to *identify* the requirements for sexual reproduction in flowering plants; *exemplify* asexual reproduction in plants; or *identify* structures that allow asexual plant reproduction to take place.